OPERATING SUMMARY

LAKEVIEW

ATER SUPPLY SYSTEM and
ATER POLLUTION CONTROL PLANT

TD
209
.L35
1973

1973

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LAKEVIEW
WATER POLLUTION CONTROL PLANT
and
WATER SUPPLY SYSTEM

MINISTRY OF THE ENVIRONMENT

1973 ANNUAL OPERATING SUMMARY

prepared by
Plant Performance Unit
TECHNICAL SERVICES BRANCH
T. Cross, Director

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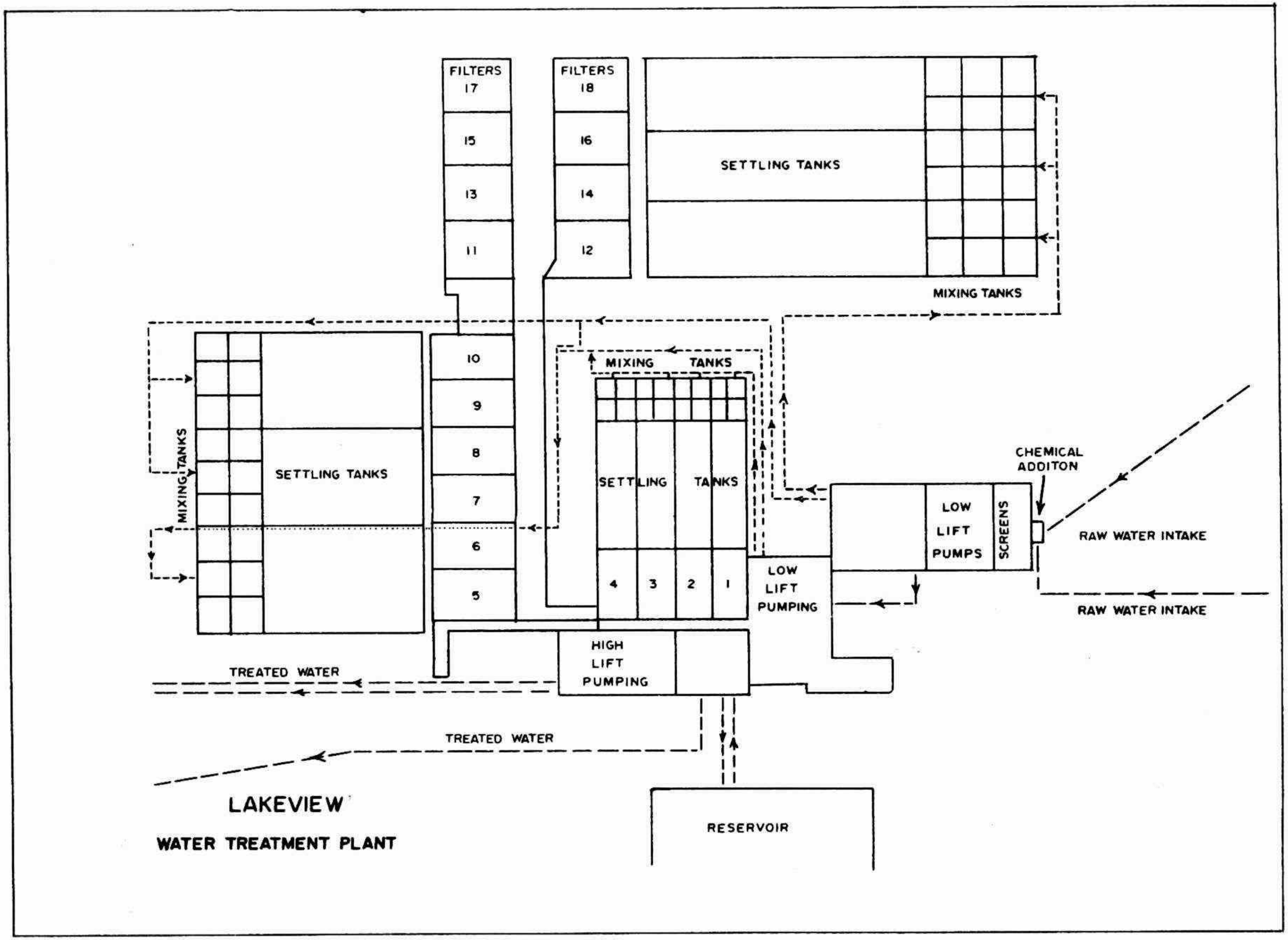
WATER SUPPLY SYSTEM



LAKEVIEW

WATER TREATMENT PLANT

DESIGN DATA

PROJECT: Lakeview WTP

NOMINAL CAPACITY: 48 MGD (filters)

INTAKES: No. 1: Size: 30" dia x 2800'
Capacity: 10 MGD

No. 2: Size: 66" dia x 3050'
Capacity: 80 MGD

SCREENS: 2, Type: Travelling
Capacity: (each) 50 MGD at LWL

LOW LIFT PUMPS:

Station No. 1 Type: Horizontal
2, Capacity: (each) 3 MGD
1, Capacity: 6 MGD
1, Capacity: 10 MGD (Diesel Engine)

Station No. 2 2, Type: Vertical
Capacity: (each) 12.5 MGD
(one variable speed)

4, Type: Vertical
Capacity: (each) 21.0 MGD

CHLORINATION

2, Prechlorinators
Capacity: (each) 0-500 lb/day

2, Postchlorinators
Capacity: 1 at 0-200 lb/day
1 at 0-400 lb/day

CHEMICAL ADDITION

2, Alum Storage Tanks
Capacity: (total) 18,000 gal.
Alum Feed Rate: 3000 gal/day (max.)

MIXING TANKS

10, Type: 6-compartment
Capacity: (total) 1.25 mil gal.

SETTLING TANKS

10, Capacity: (total) 8.27 mil gal.

FLUORIDATION

Day Tank - Capacity 120 gal.
Egg Tank - Capacity: 50 gal.
Storage Tank - Capacity: 4000 gal.
Pump Feed Rate: 120 gal/day (max.)

SODIUM CHLORITE

2, Storage Tanks
Capacity: (each) 400 gal.

2, Pumps:
Feed Rate (each) 280 lb/day

BENTONITE

Dry Chemical Feeder
Feed Rate: 180 lb/hr.

FILTERS

4, Size: 16' x 32' area
Capacity: (each) 1.5 MGD

14, Size: 23' x 46' area
Capacity: (each) 3.0 MGD

CLEAR WELL

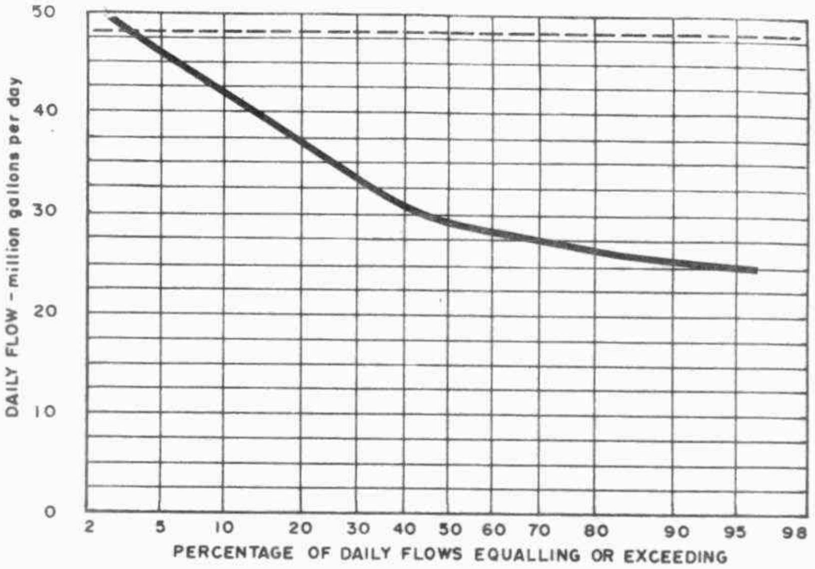
Capacity: 1 MGD (approx.)

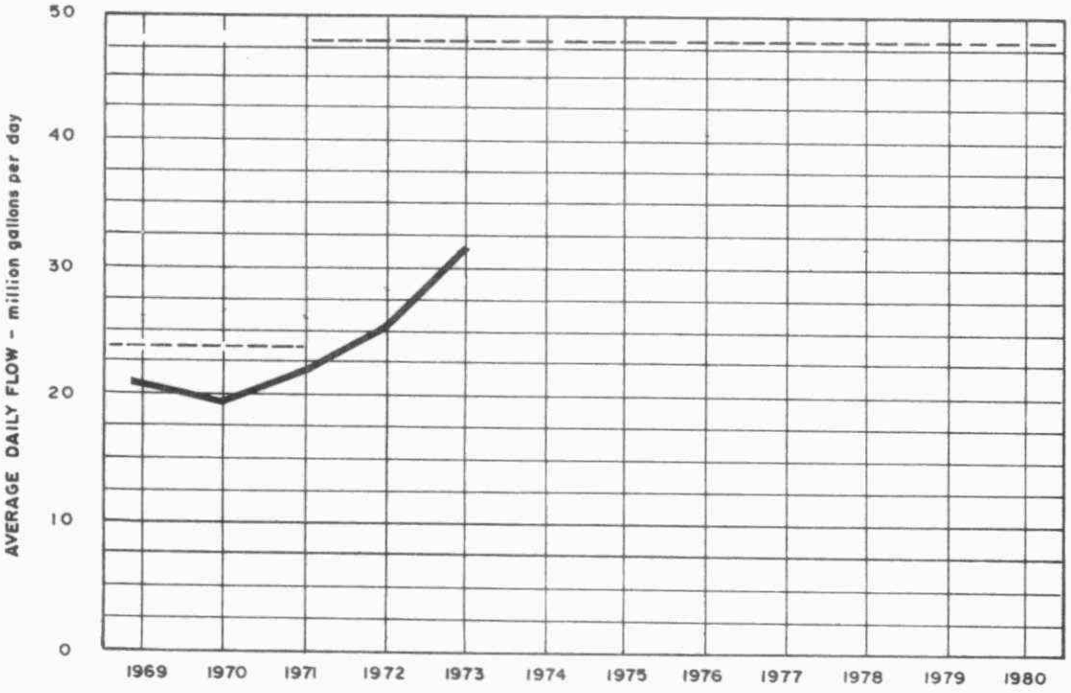
HIGH LIFT PUMPS

2, Capacity: (each) 4 MGD
(one with diesel)
1, Capacity: 6 MGD
1, Capacity: 10 MGD
3, Capacity: 14 MGD
1, Capacity: 20 MGD

RESERVOIRS
(System Total)
Capacity: 54 mil gal.

PROCESS DATA
FLOWS





DESIGN CAPACITY - - - - - - - -

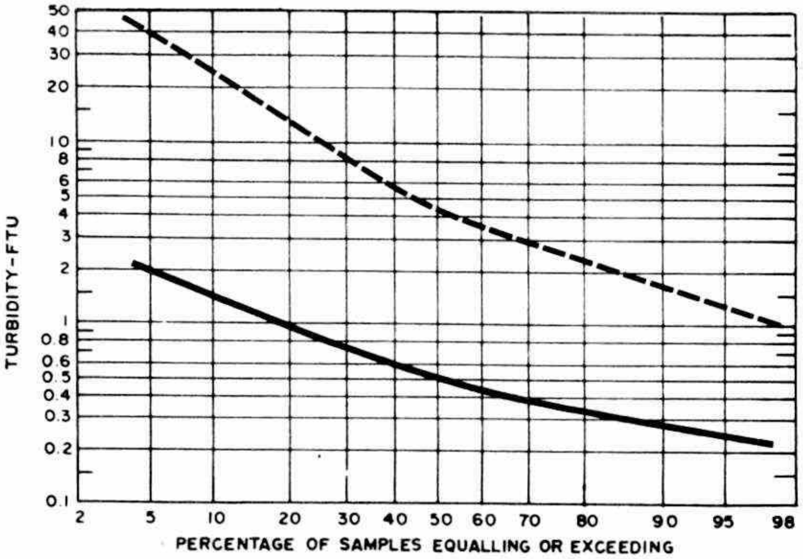
PLANT PERFORMANCE

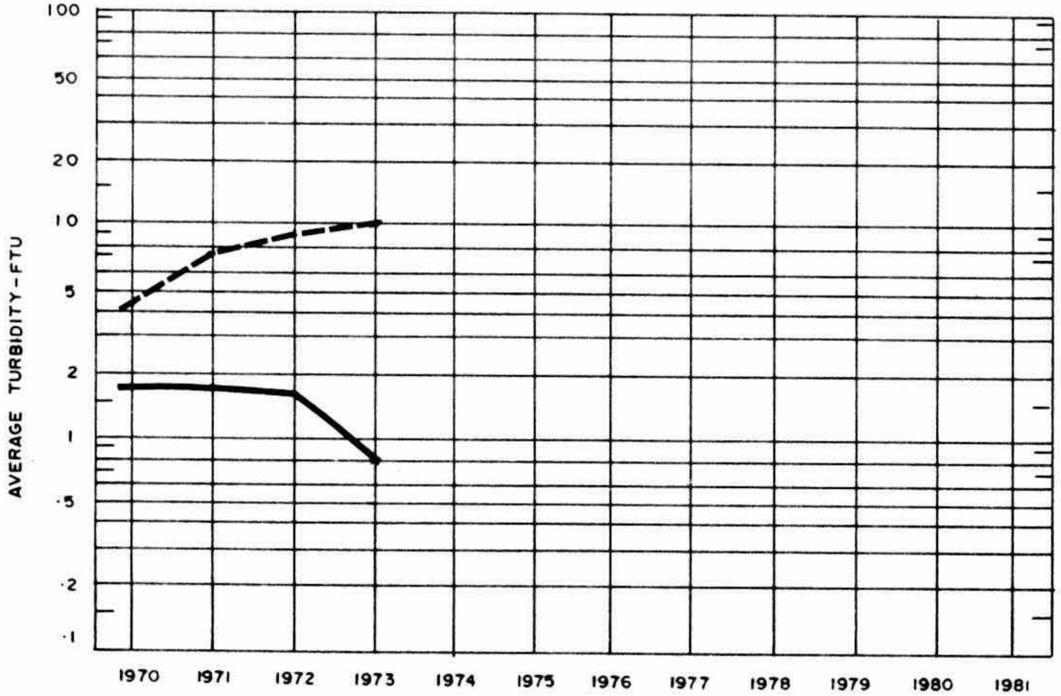
	FLOWS				RAW WATER		TREATED WATER					
							TURBIDITY		COLOUR		TEMPERATURE	
MONTH	TOTAL PLANT OUTPUT million gallons	AVERAGE DAILY FLOW million gallons	MAXIMUM DAY'S FLOW million gallons	MAXIMUM RATE mgd	TURBIDITY (AVERAGE) FTU	COLOUR (AVERAGE) App. units	AVERAGE FTU	MAXIMUM FTU	AVERAGE App. units	MAXIMUM App. units	AVERAGE °F	MAXIMUM °F
JAN	813.7	26.25	31.7	35.1	12.0	5	1.5	5.5	<5	30	41	48
FEB	754.0	26.93	33.8	40.7	20.0	5	1.6	2.2	<5	5	39	44
MAR	814.5	26.27	43.9	35.2	33.0	6	1.4	3.1	<5	5	40	43
APR	845.8	28.19	34.2	38.9	12.0	5	0.5	0.7	<5	5	44	47
MAY	914.9	29.51	44.4	37.4	3.4	5	0.6	0.9	<5	5	49	61
JUNE	1065.0	35.50	49.2	44.0	3.4	5	0.5	0.8	<5	5	55	64
JULY	1265.9	40.84	54.1	63.3	2.0	5	0.6	1.3	<5	5	60	75
AUG	1257.2	40.55	65.2	62.7	2.6	5	0.6	2.1	<5	5	63	81
SEPT	1127.7	37.59	54.3	60.9	3.2	5	0.4	0.7	<5	5	57	63
OCT	980.6	31.96	37.9	44.5	8.4	5	0.4	1.6	<5	5	55	63
NOV	869.1	28.97	33.0	34.1	8.2	5	0.3	0.9	<5	5	50	55
DEC	873.0	28.16	38.5	33.2	6.9	5	0.4	0.4	<5	5	44	48
TOTAL	11581.4				AVERAGE 10.0	AVERAGE 5						
AVG.	965.1	31.73	MAXIMUM 65.2	MAXIMUM 63.3	MAXIMUM 128.0	MAXIMUM 30	0.8	MAXIMUM 5.5	< 5	MAXIMUM 30	50	MAXIMUM 81

TREATMENT DATA

MONTH	FILTER		CHEMICALS USED							
	AVERAGE RUN hours	BACKWASH WATER mil. gal.	ALUM		SODIUM CHLORITE		SODIUM SILICOFLUORIDE			
			AMT. USED 10^3 gallons	DOSAGE mg/l	AMT. USED 10^3 pounds	DOSAGE mg/l	AMT. USED 10^3 pounds	RESIDUAL mg/l		
								AVERAGE	MAXIMUM	MINIMUM
JAN	47	15.3	14.2	11	6.2	0.8	32.7	0.99	1.15	0.90
FEB	46	14.7	19.5	17	5.4	0.7	28.9	0.96	1.05	0.90
MAR	47	18.9	28.7	23	6.8	0.8	25.3	1.04	1.20	0.98
APR	42	18.3	22.8	18	7.3	0.9	32.3	1.02	1.15	0.86
MAY	35	20.3	9.3	7	11.9	1.3	41.9	1.03	1.30	0.90
JUNE	37	22.3	11.3	7	11.5	1.1	35.6	0.98	1.12	0.80
JULY	44	22.9	4.9	4	13.1	1.0	48.2	1.00	1.38	0.90
AUG	40	25.6	8.6	5	9.9	0.8	48.9	1.02	1.20	0.92
SEPT	42	21.4	11.2	7	7.4	0.6	40.0	1.01	1.30	0.92
OCT	46	18.6	11.2	10	5.7	0.6	31.0	1.02	1.15	0.95
NOV	44	17.6	18.2	14	5.4	0.6	38.2	1.06	1.25	0.90
DEC	40	17.5	15.7	12	4.7	0.5	34.6	1.00	1.15	0.87
TOTAL		233.5	175.8		95.3		437.3			
AVG.	43	19.4	14.6	11	7.9	0.8	36.4	1.01	1.38	0.86

TURBIDITY





RAW WATER – – – – – –

TREATED WATER ———

CHLORINATION and DISINFECTION

MONTH	RAW WATER					PLANT EFFLUENT		DISTRIBUTION SYSTEM		CHLORINATION			
	NUMBER OF SAMPLES HAVING TOTAL COLIFORM ORGANISMS PER 100 ml OF					NUMBER OF SAMPLES TAKEN	NUMBER HAVING COLIFORM ORGANISMS	NUMBER OF SAMPLES TAKEN	NUMBER HAVING COLIFORM ORGANISMS	TOTAL AMOUNT OF CHLORINE USED 10^3 pounds	DOSAGE		RESIDUAL IN PLANT EFFLUENT mg/l
	0	1 - 3	4 - 32	33-320	> 320						PRE - mg/l	POST - mg/l	
JAN	0	1	1	2	1	5	0	57	0	7.5	0.6	0.3	0.5
FEB	0	2	0	0	2	4	0	47	0	6.4	0.5	0.3	0.5
MAR	0	1	0	1	2	4	1	39	0	8.2	0.7	0.4	0.5
APR	0	1	2	1	1	5	0	53	0	9.4	0.7	0.4	0.5
MAY	0	0	3	1	0	4	0	46	0	8.0	0.8	0.4	0.6
JUNE	1	0	3	0	0	4	0	44	0	14.9	1.0	0.4	0.5
JULY	1	2	2	0	0	5	0	55	0	18.3	1.0	0.5	0.6
AUG	1	0	3	0	0	4	0	44	1	20.2	1.1	0.5	0.6
SEPT	0	0	2	0	1	3	0	41	4	15.2	0.9	0.4	0.6
OCT	1	0	1	2	1	5	0	52	2	14.4	1.0	0.5	0.6
NOV	0	0	0	2	1	3	0	37	1	11.3	0.8	0.4	0.5
DEC	1	1	0	2	2	6	0	53	0	9.2	0.6	0.4	0.5
TOTAL	5	8	17	11	11	52	1	568	8	143.0			
AVG.	24 (NOTE - Average shown is the GEOMETRIC MEAN)									390.0 pounds per day	0.8	0.4	0.6

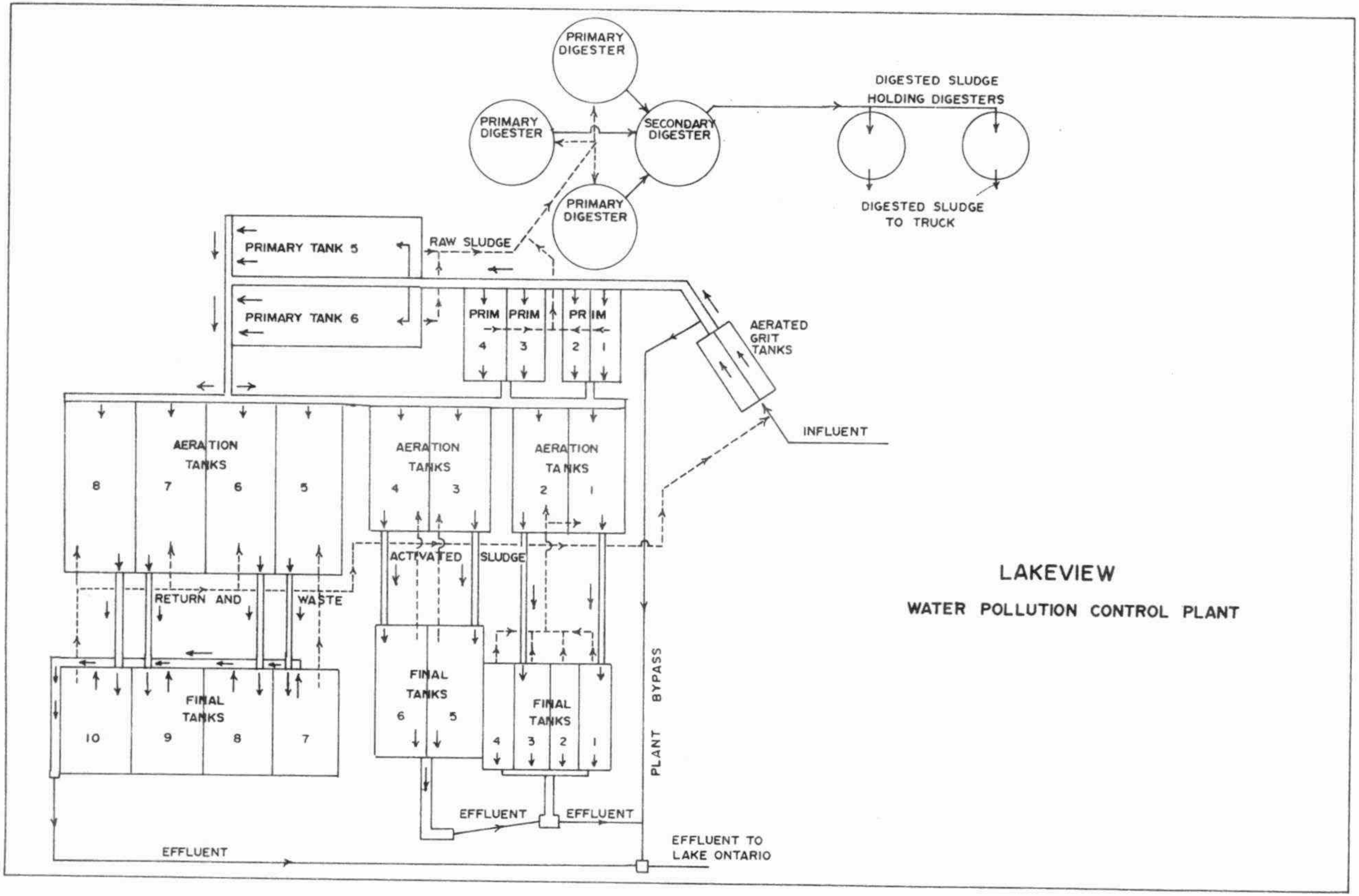
WATER QUALITY

PROPERTY	RAW WATER				TREATED WATER				DESIRABLE STANDARDS
	NUMBER OF SAMPLES	AVERAGE	MAXIMUM	MINIMUM	NUMBER OF SAMPLES	AVERAGE	MAXIMUM	MINIMUM	
HARDNESS in mg/l as $CaCO_3$	47	141	156	124	133	143	164	128	80 - 100
ALKALINITY in mg/l as $CaCO_3$	46	98	108	86	133	91	99	74	30 - 100
IRON in mg/l Fe	47	0.27	1.70	<0.05	133	<0.06	0.65	0	Less than 0.3
CHLORIDE in mg/l Cl^-	47	31	37	28	133	33	38	28	Less than 250
pH in pH units	47	8.0	8.5	7.4	133	7.0	8.1	7.3	7.0 - 8.5
FLUORIDE in mg/l F^-	40	0.3	3.6	0.1	426	0.8	1.38	0.1	Less than 1.2
AMMONIA in mg/l as N	40	0.05	0.20	<0.01	92	0.07	0.88	0.01	Less than 0.5
PHENOLS in $\mu g/l$ as C_6H_5OH	40	4	18	0	101	2	14	0	Less than 1.

TREATMENT DATA

MONTH	CONSUMPTION					
	BRAMPTON million gallons	CHINGUACOUSY TOWNSHIP million gallons	PORT CREDIT million gallons	STREETSVILLE million gallons	MISSISSAUGA million gallons	TOTAL million gallons
JAN	142.0	85.3	21.2	23.1	527.3	798.9
FEB	127.1	79.8	19.3	23.4	494.3	743.9
MAR	140.1	92.6	22.6	27.5	523.6	806.4
APR	140.2	93.6	20.9	24.9	537.6	817.2
MAY	143.7	96.6	22.8	28.5	587.2	878.8
JUNE	157.0	112.2	21.9	25.9	705.6	1022.6
JULY	178.1	143.3	31.6	29.5	850.6	1233.1
AUG	169.9	149.4	29.3	24.6	846.9	1220.1
SEPT	158.2	134.1	25.7	25.8	739.2	1083.0
OCT	149.5	117.8	23.7	20.2	616.1	927.3
NOV	137.4	128.2	21.7	18.0	554.4	859.7
DEC	134.4	100.9	21.8	18.4	570.3	845.8
TOTAL	1777.6	1333.8	282.5	289.8	7553.1	11236.8
AVG.	4.9	3.7	0.8	0.8	20.7	30.8

WATER POLLUTION CONTROL PLANT



LAKEVIEW

WATER POLLUTION CONTROL PLANT

DESIGN DATA

SOUTH PEEL - LAKEVIEW WPCP

TYPE: CONVENTIONAL ACTIVATED SLUDGE

DESIGN FLOW	37.5 MIGD
DESIGN BOD	300 mg/l
DESIGN S.S.	350 mg/l

PRETREATMENT

- Grit Removal
  Aerated tanks
  Two 106' x 21' x 13.5'
  Total vol. 375,000 gal.
  Air supply 4.2 - 6 cfm

- Screening
  Mechanical front cleaned screens
  Two with 3/4" openings in 7' channels

PRIMARY SEDIMENTATION

Two 87' x 32' x 12'
Two 87' x 48' x 12'
Two 214' x 65' x 12'
Total vol: 3.12 MG
Detention Time: 2 hr.
Overflow rate 900 gpd/ft^2

SECONDARY TREATMENT

- Aeration Tanks
  Diffused air; SPARGERS
  Two 3-pass tanks, 144' x 63' x 14.3'
  Two 3-pass tanks, 144' x 60' x 15'
  Two 4-pass tanks, 216' x 80' x 14'
  Total volume: 9.28 MG
  Detention time: 5.9 hr.
  Air supply: Three BROWN-BOVERI
  each 30,000 cfm

- Secondary Sedimentation
  Four 87' x 32' x 12'
  Two 104' x 48' x 12'
  Four 140' x 79' x 12'
  Total volume: 4.93 MG
  Detention time: 3.2 hr.
  Overflow rate: 575 gpd/ft^2

CHLORINATION

One F & P 2000 lb/day cap.
Three W & T 2000 lb/day cap.
Supply: rail tank cars.

SLUDGE HANDLING

- Primary Digesters
  Fixed roof, mixed by gas recirculation
  Three 100' dia. x 30.5' swd
  Total volume 7.88000 ft^3 or 4.9 MG

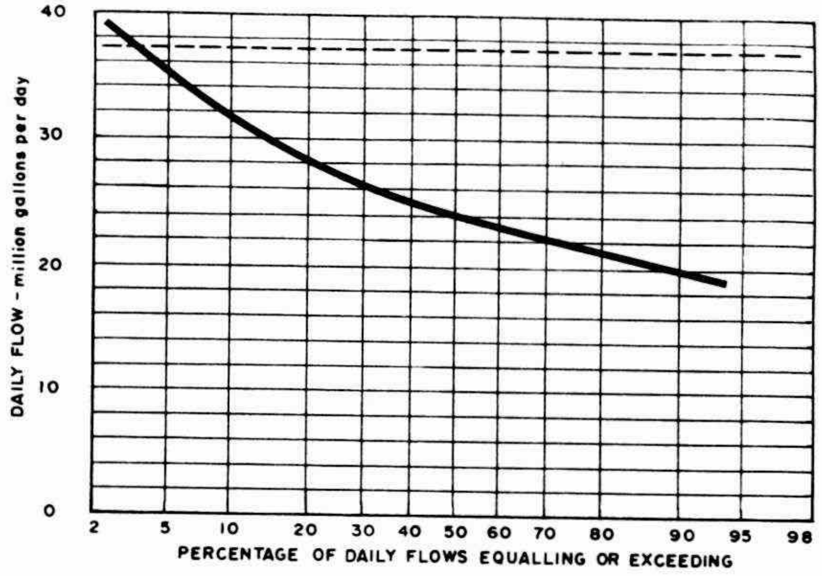
- Secondary Digesters
  Fixed concrete roof
  One 100' dia x 30.5 swd
  Volume: 262,000 ft^3 or 1.64 MG

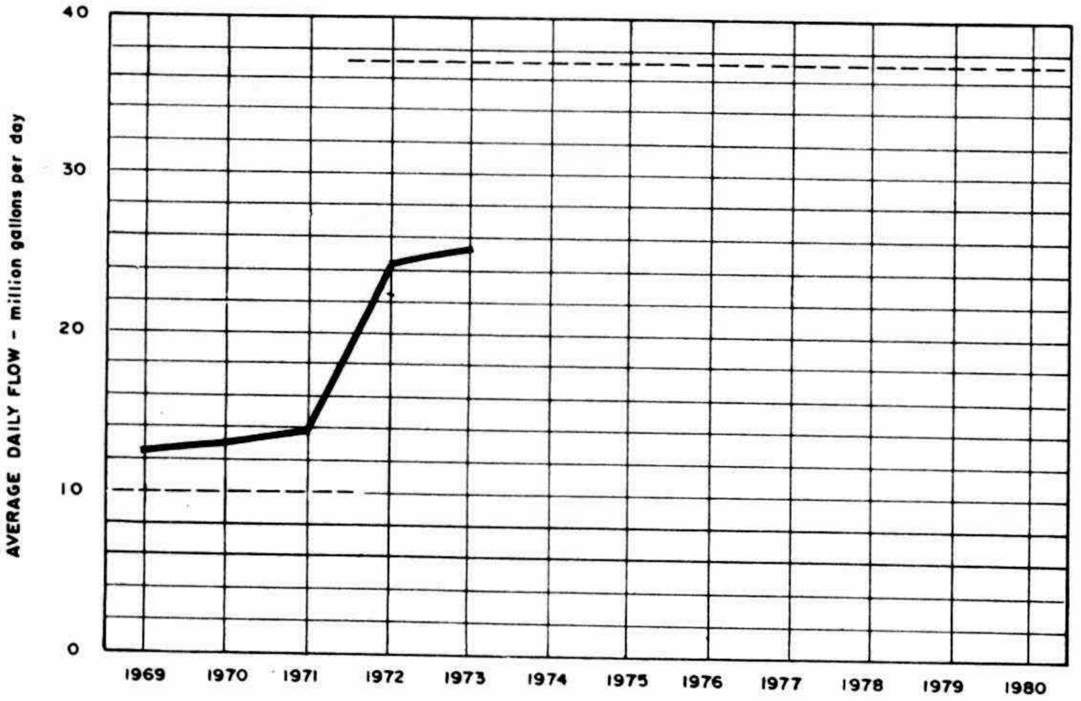
- Holding Digesters
  Fixed concrete roof
  Two 80' dia x 25.5' swd
  Total volume: 256,000 ft^3 or 1.60 MG

(NOTE: Two tanks 65' dia x 25' swd not in use)

PROCESS DATA

FLOWS



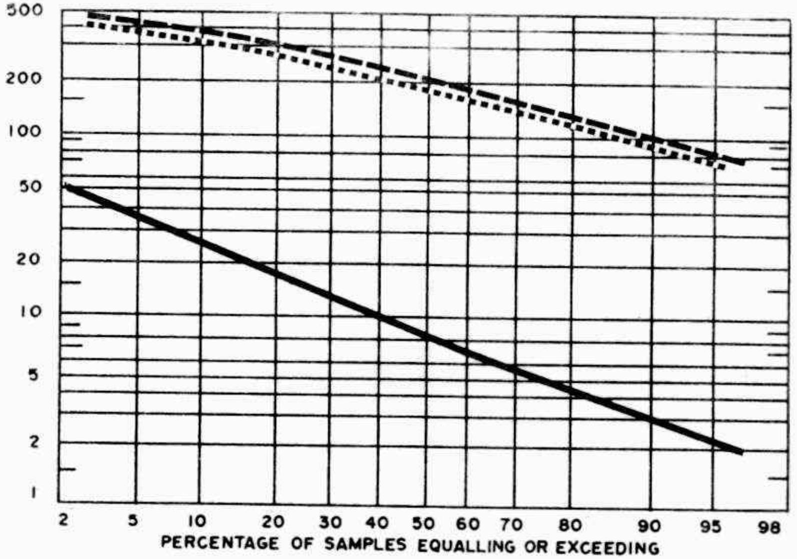


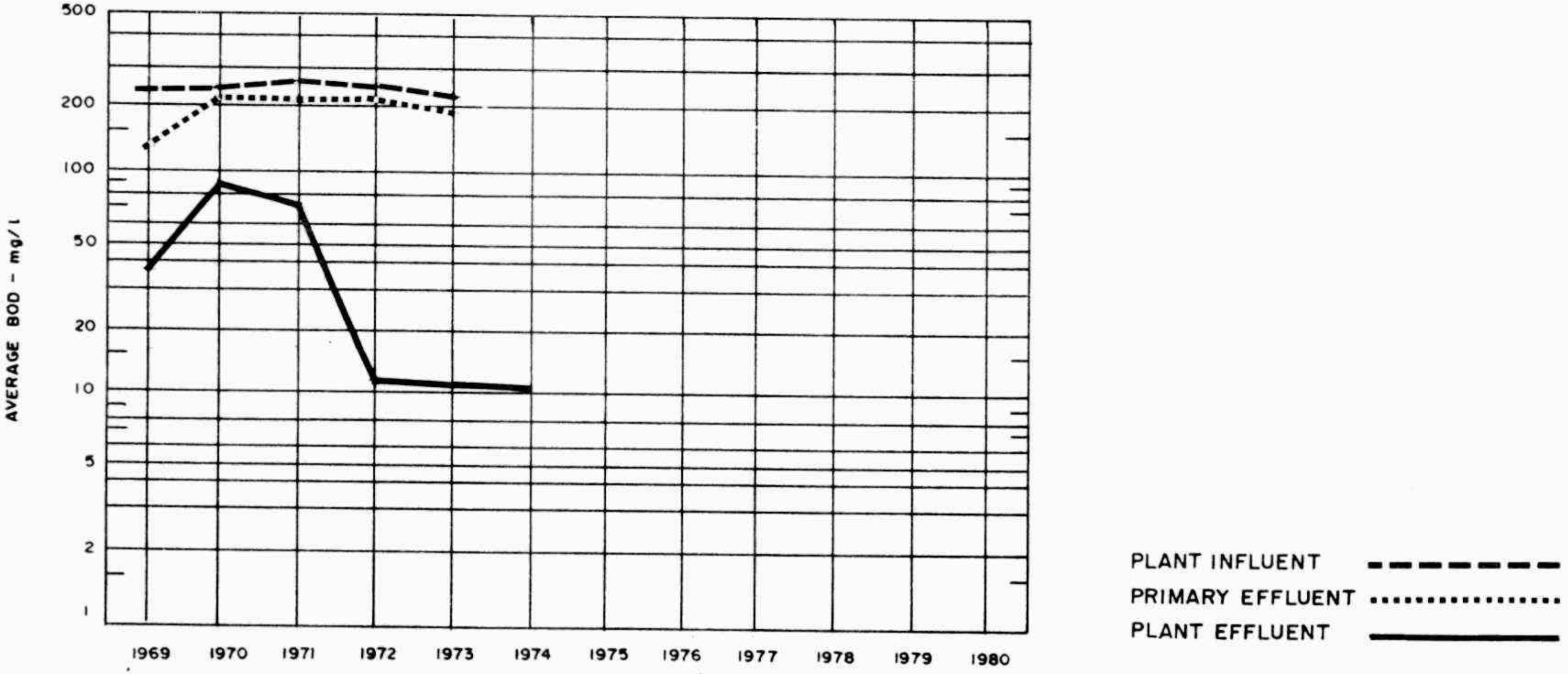
DESIGN CAPACITY — — — — — —

PLANT PERFORMANCE

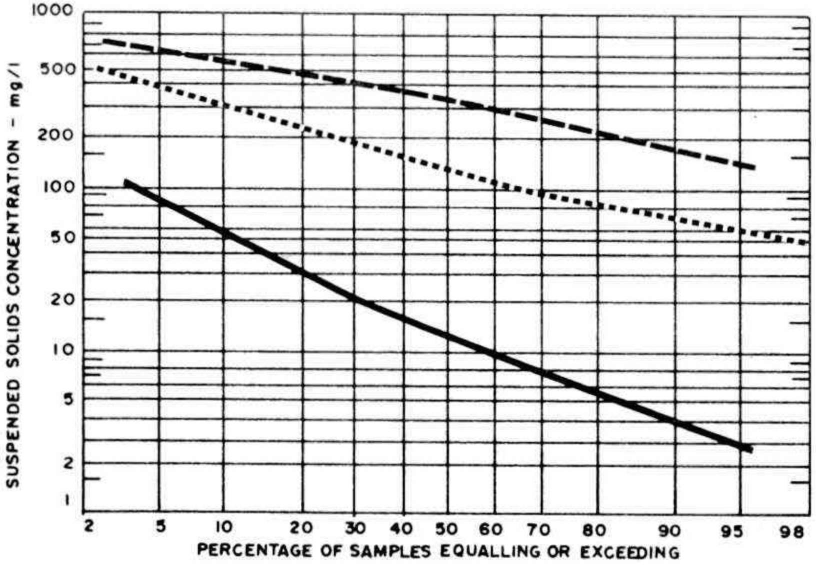
MONTH	FLOWS			BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				PHOSPHORUS	
	TOTAL FLOW	AVERAGE DAY	MAXIMUM DAY	INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT
	million gallons	mil. gal	mgd	mg/l	mg/l	%	10^6 pounds	mg/l	mg/l	%	10^6 pounds	mg/l P	mg/l P
JAN	731	23.6	34.9	277	15	94	1.91	383	20	95	2.65	16.0	3.9
FEB	603	21.5	36.5	308	13	96	1.78	416	20	95	2.39	20.0	5.3
MAR	848	27.3	43.3	218	16	93	1.71	334	25	93	2.62	18.0	7.5
APR	850	28.4	46.5	228	10	96	1.83	288	11	96	2.33	11.0	3.0
MAY	796	25.7	37.1	236	9	96	1.81	329	11	97	2.53	12.0	4.3
JUNE	703	23.4	28.7	224	10	96	1.50	385	52	86	2.34	36.0	11.0
JULY	663	21.4	28.1	300	8	97	1.94	394	29	93	2.42	13.0	5.3
AUG	706	22.8	31.1	168	3	98	1.16	291	7	98	2.01	9.9	3.9
SEPT	677	22.6	26.5	129	7	95	0.83	318	13	96	2.07		
OCT	916	29.5	47.9	201	14	93	1.71	347	57	84	2.66	10.0	3.6
NOV	857	28.6	39.2	196	15	92	1.55	306	37	88	2.31	15.0	4.1
DEC	881	28.4	47.5	254	14	94	2.11	376	12	97	3.21	19.0	2.0
TOTAL	9231	-	-	-	-	-	19.84	-	-	-	29.54	-	-
AVG.	769	25.3	MAXIMUM 47.9	224	11	95	1.65	344	24	93	2.46	15.0	4.8
No. of Samples	-	-	-	326	329	-	-	338	337	-	-	21	26

BIOCHEMICAL OXYGEN DEMAND

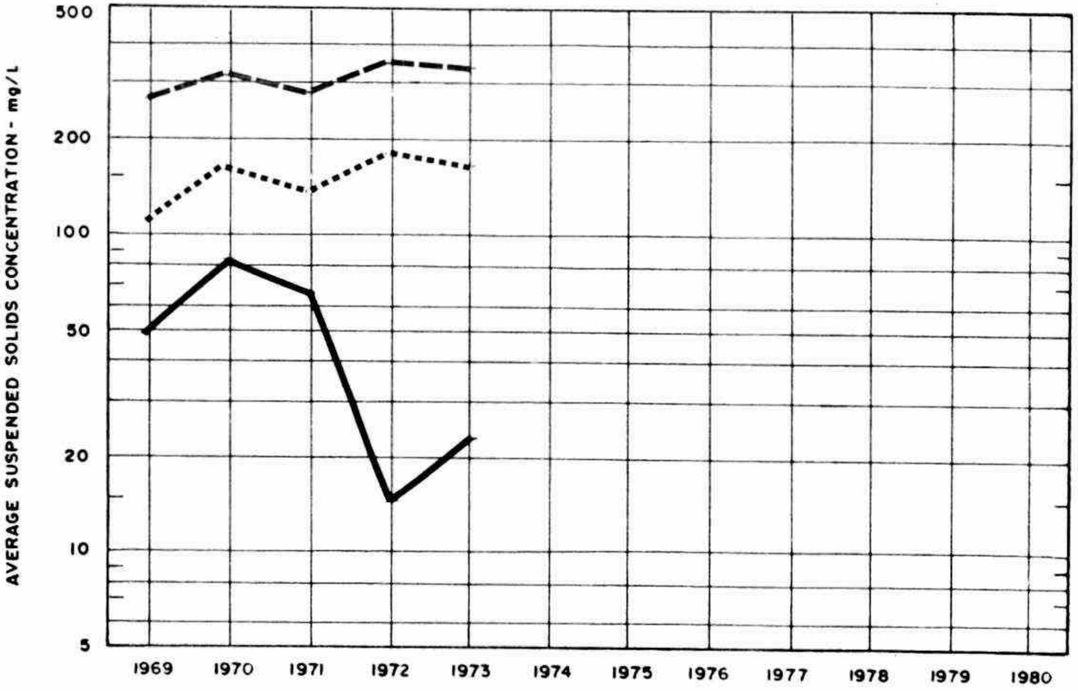




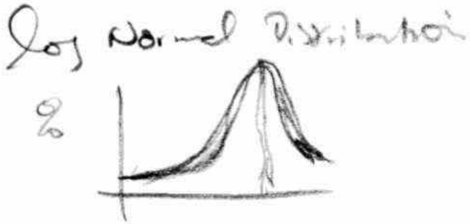
SUSPENDED SOLIDS

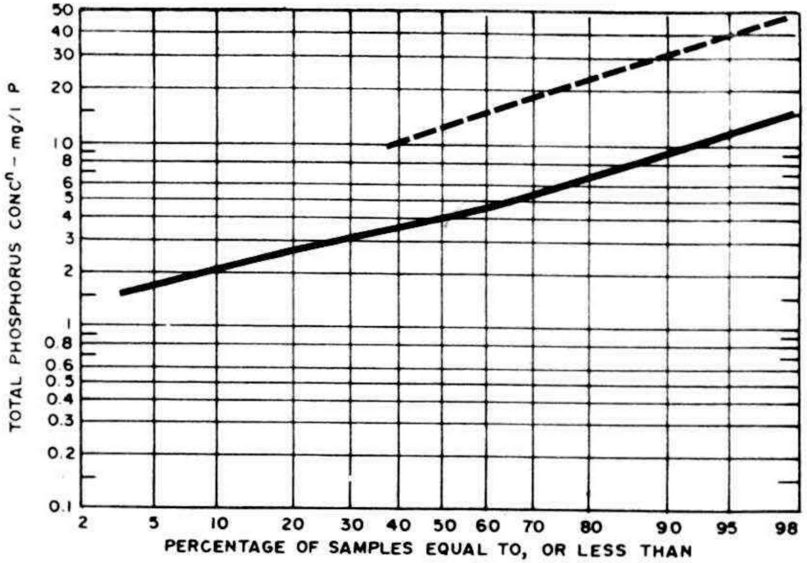


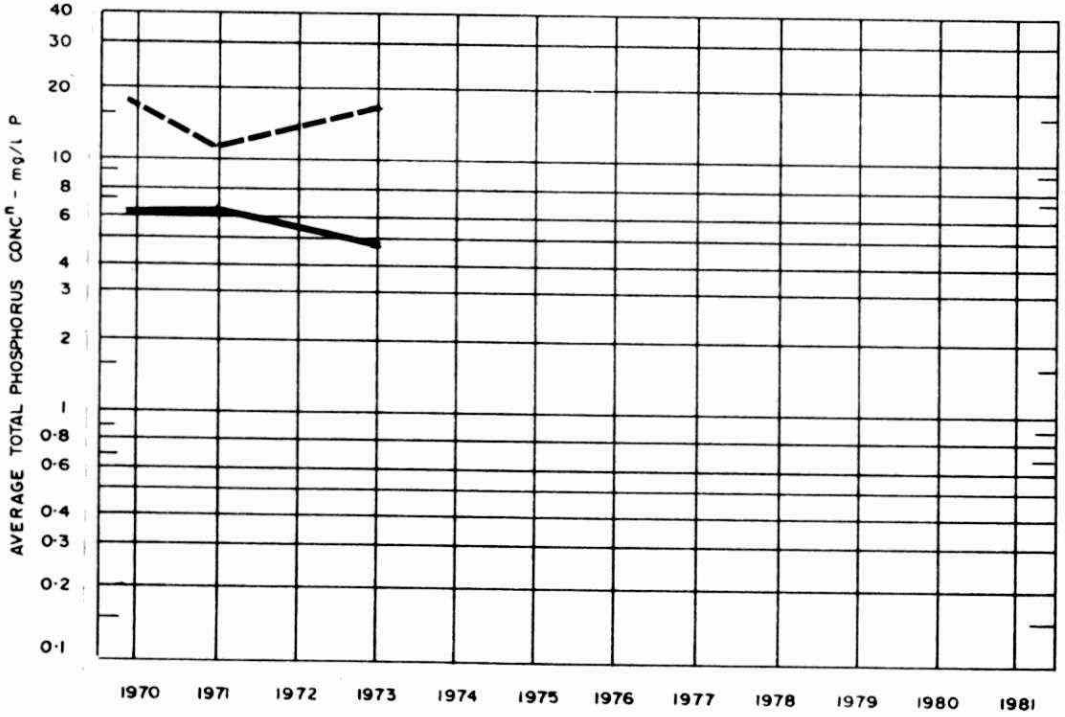
PLANT INFLUENT — — — — — —
PRIMARY EFFLUENT ················
PLANT EFFLUENT ————————



PHOSPHORUS

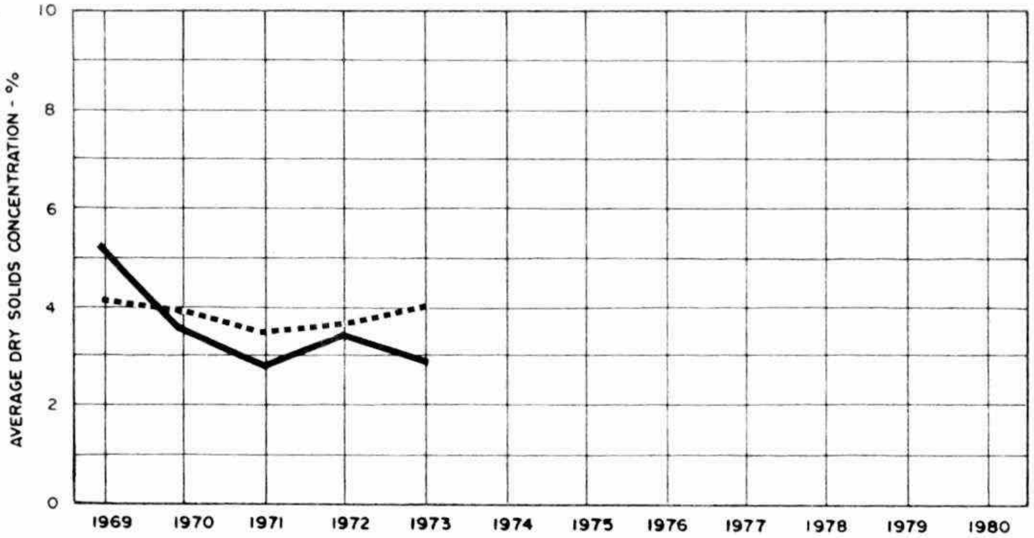




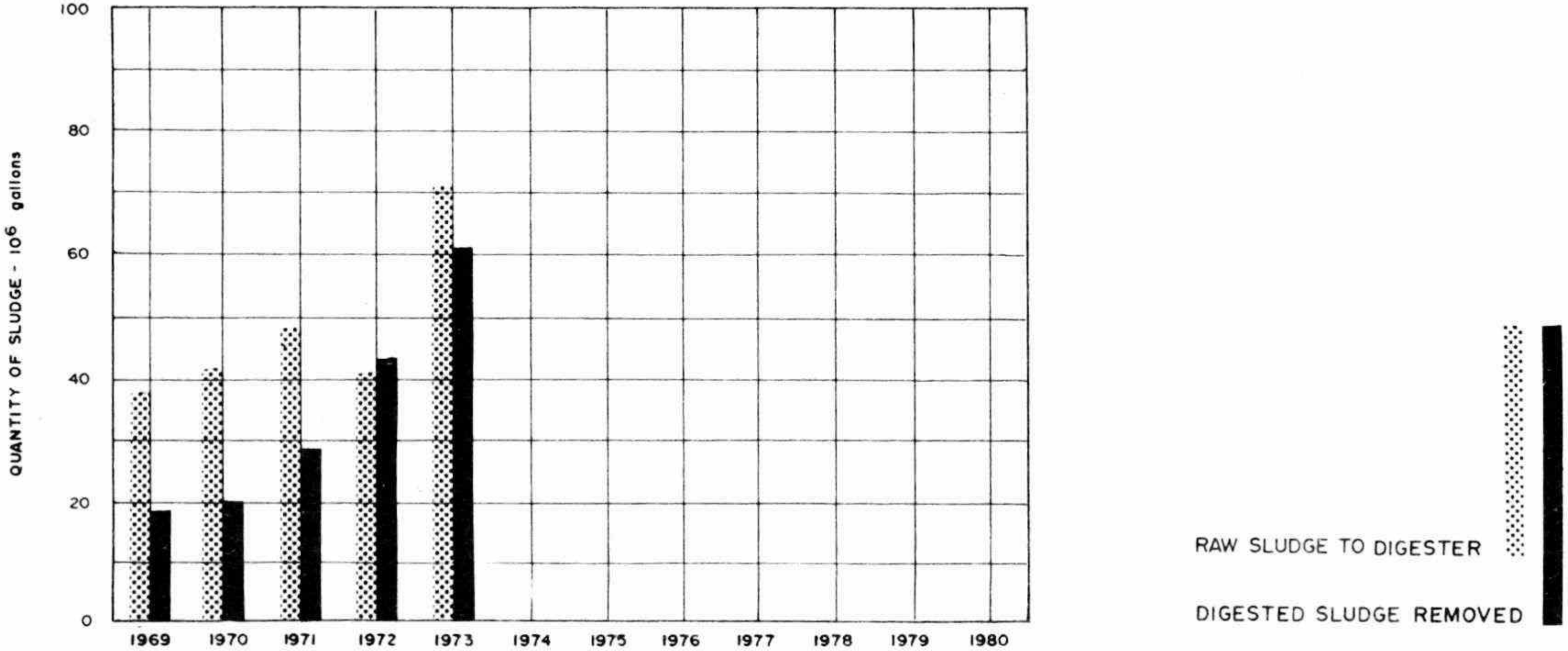


PLANT INFLUENT	– – – – – –
PLANT EFFLUENT	———

DIGESTION



RAW SLUDGE ··············
DIGESTED SLUDGE ━━━━━━
AVERAGE DRY SOLIDS CONCENTRATION - %
10
8
6
4
2
0
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980



QUANTITY OF SLUDGE - 10⁶ gallons
100
80
60
40
20
0
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980
RAW SLUDGE TO DIGESTER
DIGESTED SLUDGE REMOVED

TREATMENT DATA

MONTH	GRIT	CHLORINATION		PRIMARY EFFLUENT		AERATION			SLUDGE DIGESTION and DISPOSAL							
									RAW SLUDGE			DIGESTED SLUDGE			SUPER-NATANT	
	QUANTITY REMOVED cubic feet	Cl_2 USED 10^3 pounds	AVG. DOSE mg/l	BOD mg/l	SUSPENDED SOLIDS mg/l	MLSS CONC mg/l	F/M day^{-1}	AIR $\frac{1000\ ft^3}{lb\ BOD}$	QUANTITY 10^6 gallons	TOTAL SOLIDS %	VOL. SOLIDS %	QUANTITY 10^6 gallons	TOTAL SOLIDS %	VOL. SOLIDS %	T. S. %	AMOUNT HAULED thousand cubic yards
JAN	1650	30.9	4.2	235	218	2000		0.9	6.25	4.1	68	4.81	2.8	54		28.5
FEB	2500	28.3	4.7	209	141	2200		0.8	5.96	4.1	69	5.50	3.0	53		32.6
MAR	3600	37.0	4.4	157	156	2100			5.83	4.5	63	4.66	2.9	54		28.0
APR	3440	25.2	3.0	215	168	2400			5.70	4.1	63	4.12	3.0	49		22.6
MAY	3540	43.2	5.4	268	181	3000		1.2	5.53	3.5	65	4.49	2.5	50		26.6
JUNE	3200	32.4	4.6	168	177	3100		2.0	4.54	3.7	67	4.26	2.6	53		25.3
JULY	2100	31.1	4.7	158	147	2900		2.2	6.02	3.9	70	5.82	3.4	57		34.5
AUG	3300	29.1	4.1	113	195	2300		2.8	6.70	4.3	62	5.67	3.4	54		33.7
SEPT	3200	28.2	4.2	170	217	2100		2.0	n/a	3.5	69	6.12	4.1	50		36.3
OCT	1200	42.4	4.6	223	103	2400			4.08	3.8	69	5.11	2.8	58		30.2
NOV	2900	55.4	6.5	186	135	2900		1.8	6.11	3.9	66	4.94	2.4	55		29.3
DEC	2040	73.5	8.3	238	154	2600		1.1	7.80	4.0	67	4.73	2.4	54		28.1
TOTAL	32670	456.7	–	–	–	–	–	–		–	–	60.23	–	–	–	355.7
AVG.	3.5 cu. ft/mil gal	38.1	4.9	195	166	2500		1.6	5.87	4.0	67	5.02	2.9	53		29.6

n/a: not available

TREATMENT DATA

MONTH	FLOWS						
	METROPOLITAN TORONTO million gallons	STREETSVILLE million gallons	PORT CREDIT million gallons	CHINGUACOUSY TOWNSHIP million gallons	BRAMPTON million gallons	MISSISSAUGA million gallons	TOTAL million gallons
JAN	255.8	21.5	33.7	97.5	171.7	324.4	904.6
FEB	216.8	17.7	25.9	89.1	132.0	314.6	796.1
MAR	311.2	28.9	31.9	92.4	215.1	503.8	1183.3
APR	248.6	22.2	33.6	87.7	203.9	431.9	1027.9
MAY	259.1	19.4	37.6	78.9	195.8	383.4	974.2
JUNE	233.9	15.3	40.4	85.8	162.4	345.6	883.4
JULY	230.6	16.0	28.1	88.6	150.7	346.4	860.4
AUG	243.0	15.2	28.8	105.9	121.5	369.6	884.0
SEPT	238.7	14.4	23.8	97.8	145.3	321.8	841.8
OCT	255.7	17.4	28.9	93.4	153.7	384.7	933.8
NOV	275.2	20.0	31.7	123.9	163.7	424.3	1038.8
DEC	252.4	19.5	30.1	126.3	220.3	472.8	1121.4
TOTAL	3021.0	227.5	374.5	1167.3	2036.1	4623.3	11449.7
AVG.							

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